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PETER S DARDI
WESTMAN CHAMPLIN & KELLY
SUITE 1600 INTERNATIONAL CENTRE
900 SECOND AVENUE SOUTH
MINNEAPOLIS MN 55402-3319

EXAMINER

VERRITSKY, G

ART UNIT

PAPER NUMBER

2859

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/176,580

Applicant(s)
Sundaram et al.

Examiner
Gail Verbitsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Apr 16, 2001
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1035 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-16 and 18-22 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-16 and 18-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 2-4, 8, 11, 14, 15 are finally rejected under 35 U.S.C. 102(b) as being anticipated by Boutaghou et al.'184 [hereinafter Boutaghou].

Boutaghou discloses in Figs. 1-4 a thermal asperity sensor comprising a slider body 12, transducers (magnetoresistive sensors/ MR) 18 spaced apart on rails 26 (contours) of an air bearing surface 14 (**col. 6, lines 6-7 and Fig. 1**), a control circuitry for moving a head and lifting it above a disc surface (col. 1, lines 27-30). The transducers 18 are coupled to a peak circuitry 25 detecting a voltage spike indicative of a "thermal asperity" on a disc through bond pads (physical contact) or terminals (conductive strips) on a surface of the slider body 12 (col. 3, lines 37-38 and 56-58) and being capable to detect PZT excitation or other signals (col. 3, lines 43-45). The MR are fabricated by known technique from NiFe (col. 3, line 23) by deposition of very thin, as known in the art (col. 4, lines 8-9), layers, thus, constituting a very thin flat (planar) (col. 7, line 20) asperity contacting surface oriented along the ABS. Boutaghou also states that, during the fabrication process, portions of rails act as substrates 28 upon which sensor layers 18 are

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deposited (col. 3, lines 56-58). Since the rails are formed on the ABS (Fig. 2), inherently, it is expected that the ABS be configured prior to the deposition process. As shown in Fig. 1, the plane of the transducers is oriented along the ABS (not the trailing edge). Boutaghou states (col. 3, line 16) that PZT asperity sensors are also being used.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-6, 9-10, 13, 16, 18-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou et al. '184 [hereinafter Boutaghou].

Boutaghou discloses in Figs. 1-4 a thermal asperity sensor comprising a slider body 12, transducers (magnetoresistive sensors/ MR) 18 spaced apart on rails 26 (contours) of an air bearing surface 14 (col. 6, lines 6-7 and Fig. 1), a control circuitry for moving a head and lifting it above a disc surface (col. 1, lines 27-30). The transducers 18 are coupled to a peak circuitry 25 detecting a voltage spike indicative of a "thermal asperity" on a disc through bond pads (physical contact) or terminals (conductive strips) on a surface of the slider body 12 (col. 3, lines 36-38 and 56-58) and being capable to detect PZT excitation or other signals (col. 3, lines 43-45). The MR are fabricated by known technique from NiFe (col. 3, line 23) by deposition of very thin,

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as known in the art (col. 4, lines 8-9), layers, thus, constituting a very thin flat (planar) (col. 7, line 20) asperity contacting surface oriented along the ABS. Boutaghou also states that, during the fabrication process, portions of rails act as substrates 28 upon which sensor layers 18 are deposited (col. 3, lines 56-58). Since the rails are formed on the ABS (Fig. 2), inherently, it is expected that the ABS be configured prior to the deposition process. As shown in Fig. 1, the plane of the transducers is oriented along the ABS (not the trailing edge).

Boutaghou does not explicitly disclose conductive pads extending to the top of the glider, as stated in claim 6 and other limitations of claims 5, 9-10, 13, 16, 18-19 and 21.

With respect to the particular location of the conductive pads and the transducers as stated in claims 6 and 10 respectively: it would have been obvious to one having ordinary skill in the art at the time the invention was made to relocate the conductive pads and transducers disclosed by Boutaghou (col. 3, lines 37-38), since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

With respect to the particular size of the transducers (how far it extends on the slider) as stated in claim 9: the particular size of the transducers, absent any criticality, is only considered to be the “optimum” size of the transducers in the device disclosed by Boutaghou that a person having ordinary skill in the art would have been able to determine using routine experimentation based, among other things, on the size of the device, etc. In re Boesch, 205 USPQ 215 (CCPA 1980).

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With respect to the particular location of the conductive strips, i.e., on the plateau on the ABS, as stated in claim 13: it would have been obvious to one having ordinary skill in the art at the time the invention was made to relocate the conductive strips disclosed by Boutaghou (col. 3, lines 37-38), since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

With respect to claims 16 and 18: the deposition of the thermal transducer onto the ABS before or after the glide head is sliced from a wafer, absent any criticality, is only considered to be the “optimum” or “preferred” sequence of steps of the manufacturing process that a person having ordinary skill in the art at the time the invention was made would have been found obvious to provide using routine experimentation based, among other things, on the type of manufacturing process being used.

With respect to claims 16, 18-19: the method steps will be met during the normal manufacturing of the device stated above.

5. Claim 7 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 2-6, 9-11, 13-16, 18-19 and 21 above, and further in view of Kennedy et al. [hereinafter Kennedy].

Boutaghou discloses the device as stated above in paragraph 4.

Boutaghou does not disclose the limitations of claim 7.

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Kennedy discloses a device in the field of applicant's endeavor wherein a PZT 70 connected to a signal processing unit 19 with a pair of electrical leads 17 to provide communication between the PZT and a processing circuit.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add leads, as taught by Kennedy, to the device disclosed by Boutaghou, in order to provide an electrical connection, as already suggested by Kennedy, and to make it possible for a user to communicate the signal from the transducer to a signal processing unit at any location.

6. Claim 12 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 2-6, 9-11, 13-16, 18-19 and 21 above, and further in view of Flechsig et al. [hereinafter Flechsig].

Boutaghou discloses a device as stated above in paragraphs 4.

Boutaghou does not explicitly disclose grounding of the thermal transducers as stated in claim 12.

Flechsig discloses in Fig. 9 a port 120 to which a sensor 91 is grounded.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to electrically ground transducers disclosed by Boutaghou to a ground port, as taught by Flechsig, in order to stabilize or limit the voltage to ground.

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Official Notice is taken with respect to having a common electrical ground as stated in claim 12 since it is very well known in the art to electrically ground transducers in the same circuitry or device to the same (common) electrical ground conductor in order to minimize the number of lines having "0" potential in the same circuitry and, thus, to minimize noise-to-signal ratio.

7. Claims 20 and 22 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou '184 as applied to claims 2-6, 9-11, 18-19 and 21 in view of Nguyen et al. [hereinafter Nguyen].

Boutaghou discloses the device as stated above in paragraphs 4.

Boutaghou does not explicitly disclose the limitations of claims 20 and 22.

Nguyen discloses a device comprising a thin film transducer 28 mounted on a rail 24 mounted on an ABS 23 or 24 (col. 2, lines 36-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the MR sensors in the device disclosed by Boutaghou of a thin film, as taught by Nguyen, because it is very well known in the art to make a MR sensor using a thin film technology.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Response to Arguments

9. Applicant's arguments filed April 16, 2001 have been fully considered but they are not persuasive.

Applicant states that, according to Fig. 3 of Boutaghou, the sensors are located on the trailing edge. However, it appears that there is no support to this statement present in the description of Fig. 3 of Boutaghou. On the other hand, Examiner invites applicant to refer to col. 6, lines 6-7 of Boutaghou where it is stated that “by including MR sensors spaced apart **on ABS 14** of the slider body, the likelihood that at least one of the MR sensors will contact broad shallow defects, such as asperity 34, increases”. Thus, it appears that Boutaghou positions the MR sensors on the ABS.

The applicant's statement that “the Examiner consistently has indicated that it is conventionally to place MR elements on the ABS” (present amendment, page 3) is not understood by the Examiner because, it appears, that such an indication is not present in the Office Action (Paper No. 13). Examiner would appreciate if applicant clarifies this statement.

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With respect to claims 16, 18: Applicant states that the prior art discloses that “the glide heads are cut from a wafer with the air bearing surface being oriented along the cut edge” and that the prior art does not teach or suggest placement of the sensors oriented along the ABS. Please refer to col. 6, lines 6-7 of Boutaghou, which states that the sensors are oriented along the ABS. Also, upon further consideration (in between June 14, 2000 and January 19, 2001, as stated by applicant in page 5 of the present amendment), the Examiner realized that allowance of claims 16 and 18 made previously was not sufficient because the deposition of the thermal transducers onto the ABS before or after the glide head is sliced from a wafer, absent any criticality, is only considered to be the “optimum” or “preferred” steps of the manufacturing process that a person having ordinary skill in the art at the time the invention was made would have been found obvious to provide using routine experimentation based, among other things, on the type of a manufacturing process is being used.

With respect to claims 19 and 21: Since the rails are formed on the ABS (Fig. 2) of Boutaghou, inherently, it is expected that the ABS be configured (contoured) prior to the deposition process. (see paragraphs 4 and 6 of the present Office Action).

With respect to claim 7: Applicant states that Kennedy does not provide any guidance on the connecting transducers/sensors on the ABS with the top surface of the slider:

A) Applicant should note that: a reference is to be considered not only for what is expressly states, but for what it would reasonably have suggested to one of ordinary skill in the art. *In re DeLissle*, 160 USPQ 806 (CCPA 1969).

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B) Also, in her rejection of the merits of claim 7, the Examiner uses Kennedy only for the electrical leads. Boutaghou discloses the transducers positioned along the ABS, therefore, the combination of Boutaghou and Kennedy renders claim 7 obvious.

With respect to claim 12: Applicant states that Flechsig does not disclose transducers/sensors oriented along ABS. However, as stated by the Examiner above, Boutaghou discloses the transducers positioned along the ABS, therefore, the combination of Boutaghou and Flechsig renders claim 12 obvious.

With respect to claims 20 and 22: Applicant states that Nguyen does not disclose the transducers/sensors along the ABS. However, the Examiner uses Nguyen only for replacing the Boutaghou transducers with thin film transducers. The combination of Boutaghou and Nguyen disclose thin film transducers (of Nguyen) oriented along the ABS (of Boutaghou) and, thus, renders claims 20 and 22 obvious.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication should be directed to the examiner Verbitsky whose telephone number is (703) 306-5473.

Any inquiry related to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

GKV

May 31, 2001



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800